Preliminary Regional Analysis of Fish Consumption Rate Estimates for Rural Alaska Populations

Prepared by Alaska Dept. of Fish & Game Division of Subsistence for the Human Health Criteria Technical Workgroup discussion, October 2016

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Brief review of methodology

ADF&G Division of Subsistence collects information on harvest and use patterns through questions on household surveys pertaining to the amounts of resources harvested by the household and, regardless of any household harvest, if a household used, gave away, or received a resource. Survey designs take the form as either comprehensive (including all resource categories: salmon, non-salmon fish, marine invertebrates, land mammals, marine mammals, and vegetation) or targeted surveys (i.e. salmon only). Depending on community size, a 70 -100% sample achievement is often sought and attained.

Communities surveyed by ADF&G Division of Subsistence, representing 2012-2014 harvest (study) years, were considered for inclusion in this preliminary analysis. A total of 78 communities, representing all six regions of Alaska (southeast (n=6), southcentral (n=20), southwest (n=16), western (n=6), arctic (n=21), interior (n=9)) were included in the analysis thus far (refer to Appendix A and B for map of regions and list of communities included in analysis, respectively). All salmon, non-salmon fish, marine invertebrate, and marine mammal harvest and use information was selected from community survey data when available and any fish harvested for dog food was removed prior to analysis.

Computation of percentile groups was done based on previous work between ADF&G Division of Subsistence and DEC for the development of wild food consumption rate estimates (see Wolfe & Utermohle, 2000). Briefly, the method to determine percentiles of fish consumption involves creating three user groups within each community: 1) households that harvested a resource and did not share; 2) households that harvested a resource and shared with others or households that did not harvest a resource and received from others; 3) households that did not use the resource. For households harvesting and not sharing, use level per person is computed by dividing total household harvest by total household size. Households in user group two, who constitute a sharing group, use level per person is computed by summing all household harvests of those households that harvested and shared and dividing it by the sum of all households who gave or received the resource. Non-users received a use level of zero. Each use level is then rank ordered and the percentile rank occupant of interest (75^{th}, 85^{th}, 90^{th}, and 95^{th}) is identified.

Note that for this preliminary analysis all user groups were included in the rank ordering of use levels and future analyses will compare all user groups to users only. Work on fish consumption rate estimates for urban and statewide residents are underway and will available in next rendition.

Table 1. Sum total non-salmon fish and marine invertebrate per capita consumption comparisons, Alaska.

	Fish Consumption Estimates Per Capita (grams per day)					
	All user groups					
			Percentiles			
Area	Mean	Median	75th	85th	90th	95th
Statewide	-	-	-	-	-	-
Urban	8.9	-	-	-	-	-
Rural/Subsistence	49.3	27.1	48.0	63.1	74.9	153.5
Southeast	44.0	32.2	74.9	82.6	91.9	118.4
Southcentral	10.5	5.7	10.9	17.3	27.0	37.0
Southwest	5.0	0.0	9.7	9.7	17.0	21.7
Western	37.6	45.1	45.1	47.9	68.3	98.1
Arctic	76.6	44.9	62.9	63.5	169.1	189.1
Interior	44.9	16.3	57.9	152.9	171.4	176.4

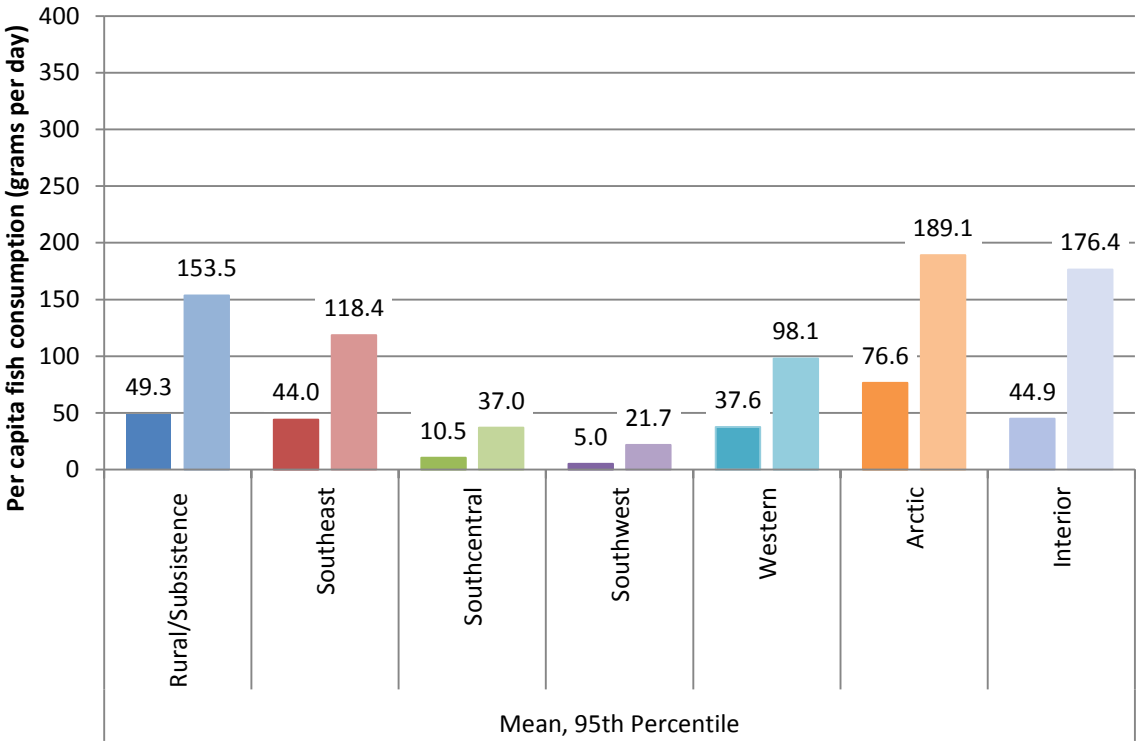


Figure 1. Mean and 95th percentile fish consumption rate comparisons by region: non-salmon fish and marine invertebrates.

Table 2. Sum total salmon, non-salmon fish, and marine invertebrate per capita consumption comparisons, Alaska.

	Fish Consumption Estimates Per Capita (grams per day)					
	All user groups					
			Percentiles			
Area	Mean	Median	75th	85th	90th	95th
Statewide	-	-	-	-	-	-
Urban	8.9	-	-	-	-	-
Rural/Subsistence	131.5	120.3	160.2	194.8	212.7	274.5
Southeast	153.9	95.7	160.8	369.4	375.0	392.8
Southcentral	113.3	82.8	148.2	170.8	187.4	232.2
Southwest	267.3	213.4	274.5	396.3	396.3	396.3
Western	132.6	120.3	153.1	158.0	168.8	271.9
Arctic	127.0	119.9	151.7	188.2	195.6	197.1
Interior	154.3	198.6	233.6	319.5	356.0	356.0

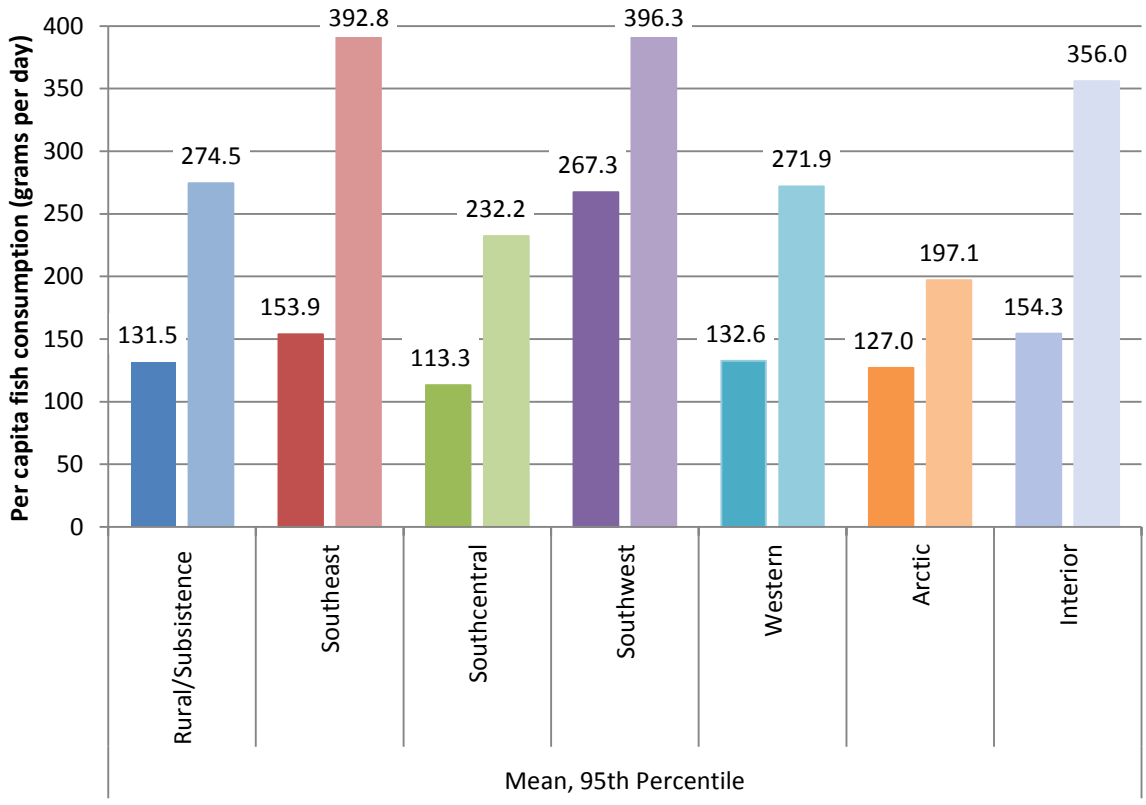


Figure 2. Mean and 95th percentile fish consumption rate comparisons by region: salmon, non-salmon fish, and marine invertebrates.

Table 3. Sum total salmon, non-salmon fish, marine invertebrate, and marine mammal per capita consumption comparisons, Alaska

	Fish Consumption Estimates Per Capita (grams per day)					
	All user groups					
			Percentiles			
Area	Mean	Median	75th	85th	90th	95th
Statewide	-	-	-	-	-	-
Urban	8.9	-	-	-	-	-
Rural/Subsistence	132.2	121.0	160.2	194.8	212.7	274.1
Southeast	160.5	95.7	180.1	379.8	381.2	381.2
Southcentral	113.2	82.8	145.2	173.3	187.4	232.2
Southwest	267.3	213.4	274.5	396.3	396.3	396.3
Western	132.3	121.0	148.8	168.2	177.7	266.4
Arctic	127.5	118.4	151.7	188.2	194.8	200.3
Interior	154.8	198.6	233.6	310.3	356.0	356.0

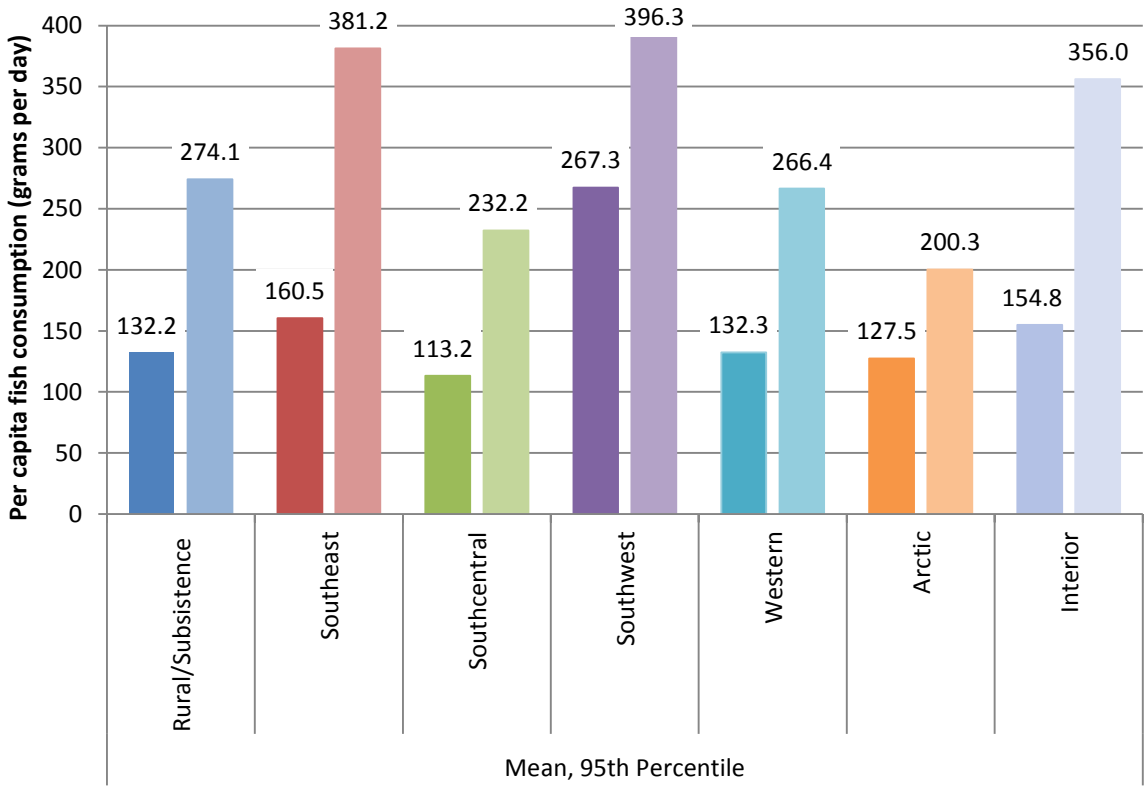
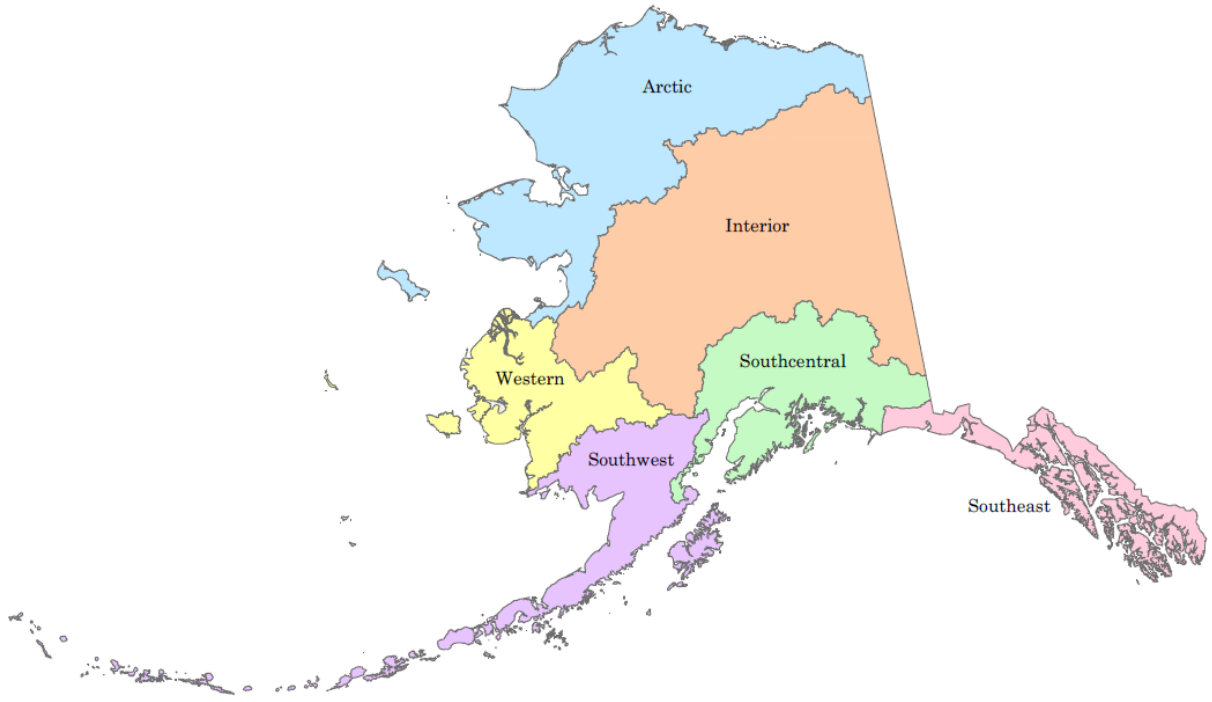


Figure 3. Mean and 95th percentile fish consumption rate comparisons by region: salmon, non-salmon fish, marine invertebrates, and marine mammals.

Appendix A

Map of Alaska regions applied in analysis.



Appendix B

Table 4. Southeast study communities.

		Sampled		Estimated community		
Community	Study year	Households	Population	Households	Population	Study type
Angoon	2012	51	143	122	342	Comprehensive
Haines	2012	132	310	818	1921	Comprehensive
Hoonah	2012	122	319	280	732	Comprehensive
Hydaburg	2012	48	134	119	332	Comprehensive
Whale Pass	2012	21	43	27	55	Comprehensive
Klukwan	2014	24	48	32	64	Comprehensive

Note 'Comprehensive' denotes that a full range of resource categories were asked about on the survey, including salmon, non-salmon fish, marine invertebrates, land mammals, marine mammals, and vegetation.

Table 5. Southcentral study communities.

		Sampled		Estimated community		
Community	Study year	Households	Population	Households	Population	Study type
Chitina	2012	46	114	54	134	Comprehensive
Gakona	2012	42	110	77	202	Comprehensive
Kenny Lake	2012	67	164	174	417	Comprehensive
McCarthy Road	2012	39	69	58	103	Comprehensive
Glennallen	2013	77	211	140	384	Comprehensive
Gulkana	2013	29	91	33	104	Comprehensive
Lake Louise	2013	10	19	14	27	Comprehensive
Tazlina	2013	79	232	120	352	Comprehensive
Tonsina	2013	23	53	39	90	Comprehensive
Tyonek	2013	49	111	63	143	Comprehensive
Mendeltna	2013	10	24	14	34	Comprehensive
Paxson	2013	8	23	11	32	Comprehensive
Nelchina	2013	18	47	29	76	Comprehensive
Tolsona	2013	8	16	12	24	Comprehensive
Chenega	2014	12	25	17	35	Comprehensive
Cordova	2014	184	504	950	2602	Comprehensive
Nanwalek	2014	56	223	58	231	Comprehensive
Port Graham	2014	41	105	58	149	Comprehensive
Seldovia	2014	95	208	127	278	Comprehensive
Tatitlek	2014	21	58	27	75	Comprehensive

Note 'Comprehensive' denotes that a full range of resource categories were asked about on the survey, including salmon, non-salmon fish, marine invertebrates, land mammals, marine mammals, and vegetation.

Table 6. Southwest study communities.

		Sampled		Estimated community		
Community	Study year	Households	Population	Households	Population	Study type
Clarks Point	2013	13	26	15	30	Salmon only
Ekwok	2013	29	88	34	103	Salmon only
Koliganek	2013	48	171	60	214	Salmon only
New Stuyahok	2013	89	399	121	542	Salmon only
Chignik City	2014	25	64	30	77	Salmon only
Chignik Lagoon	2014	16	45	25	70	Salmon only
Chignik Lake	2014	19	55	26	75	Salmon only
Clarks Point	2014	13	27	15	31	Salmon only
Dillingham	2014	100	283	718	2032	Salmon only
Egegik	2014	20	57	25	71	Comprehensive
Ekwok	2014	30	84	36	101	Salmon only
Koliganek	2014	51	168	60	198	Salmon only
New Stuyahok	2014	101	464	112	515	Salmon only
Perryville	2014	34	99	39	114	Salmon only
Pilot Point	2014	17	47	23	64	Comprehensive
Ugashik	2014	7	10	7	10	Comprehensive

Note 'Comprehensive' denotes that a full range of resource categories were asked about on the survey, including salmon, non-salmon fish, marine invertebrates, land mammals, marine mammals, and vegetation; 'Salmon only' denotes that only salmon were asked about on the survey.

Table 7. Western study communities.

		Sampled		Estimated community		
Community	Study year	Households	Population	Households	Population	Study type
Bethel	2012	466	1607	1645	5673	Comprehensive
Eek	2013	64	247	90	347	Comprehensive
Pilot Station	2013	94	460	128	626	Comprehensive
Quinhagak	2013	109	493	162	733	Comprehensive
Scammon Bay	2013	86	439	123	628	Comprehensive
Tuntutuliak	2013	67	266	104	413	Comprehensive

Note 'Comprehensive' denotes that a full range of resource categories were asked about on the survey, including salmon, non-salmon fish, marine invertebrates, land mammals, marine mammals, and vegetation.

Table 8. Arctic study communities.

Community	Study year	Sampled		Estimated community		Study type
		Households	Population	Households	Population	
Ambler	2012	53	197	76	282	Comprehensive
Golovin	2012	33	101	59	181	Comprehensive
Kobuk	2012	30	137	36	164	Comprehensive
Noorvik	2012	83	360	135	586	Comprehensive
Point Lay	2012	42	163	67	260	Comprehensive
Shungnak	2012	46	183	69	275	Comprehensive
Deering	2013	32	93	44	128	Comprehensive
Diomede	2013	25	51	39	80	Comprehensive
Stebbins	2013	87	369	135	573	Fish only
Wainwright	2013	80	283	150	531	Fish only
Anaktuvuk Pass	2014	53	170	99	318	Comprehensive
Barrow	2014	259	869	1584	5315	Comprehensive
Buckland	2014	90	475	98	517	Fish only
Kiana	2014	73	295	98	396	Fish only
Kotzebue	2014	214	773	826	2984	Comprehensive
Noatak	2014	106	469	125	553	Fish only
Nuiqsut	2014	58	223	108	415	Comprehensive
Point Hope	2014	105	439	176	736	Comprehensive
Selawik	2014	161	692	183	787	Fish only
Shishmaref	2014	86	379	140	617	Comprehensive
Wainwright	2014	75	292	145	565	Fish only

Note 'Comprehensive' denotes that a full range of resource categories were asked about on the survey, including salmon, non-salmon fish, marine invertebrates, land mammals, marine mammals, and vegetation; 'Fish only' denotes that only salmon and non-salmon fish were asked about on the survey.

Table 9. Interior study communities.

Community	Study year	Sampled		Estimated community		Study type
		Households	Population	Households	Population	
Manley Hot Springs	2012	41	87	58	123	Comprehensive
Minto	2012	46	133	61	176	Comprehensive
Shageluk	2013	26	76	29	85	Comprehensive
Healy	2014	127	349	366	1006	Comprehensive
Hughes	2014	26	69	34	90	Comprehensive
Northway	2014	55	146	73	194	Comprehensive
Rampart	2014	7	21	13	39	Comprehensive
Stevens Village	2014	4	10	4	10	Comprehensive
Tanana	2014	66	148	91	204	Comprehensive

Note 'Comprehensive' denotes that a full range of resource categories were asked about on the survey, including salmon, non-salmon fish, marine invertebrates, land mammals, marine mammals, and vegetation.

Appendix C

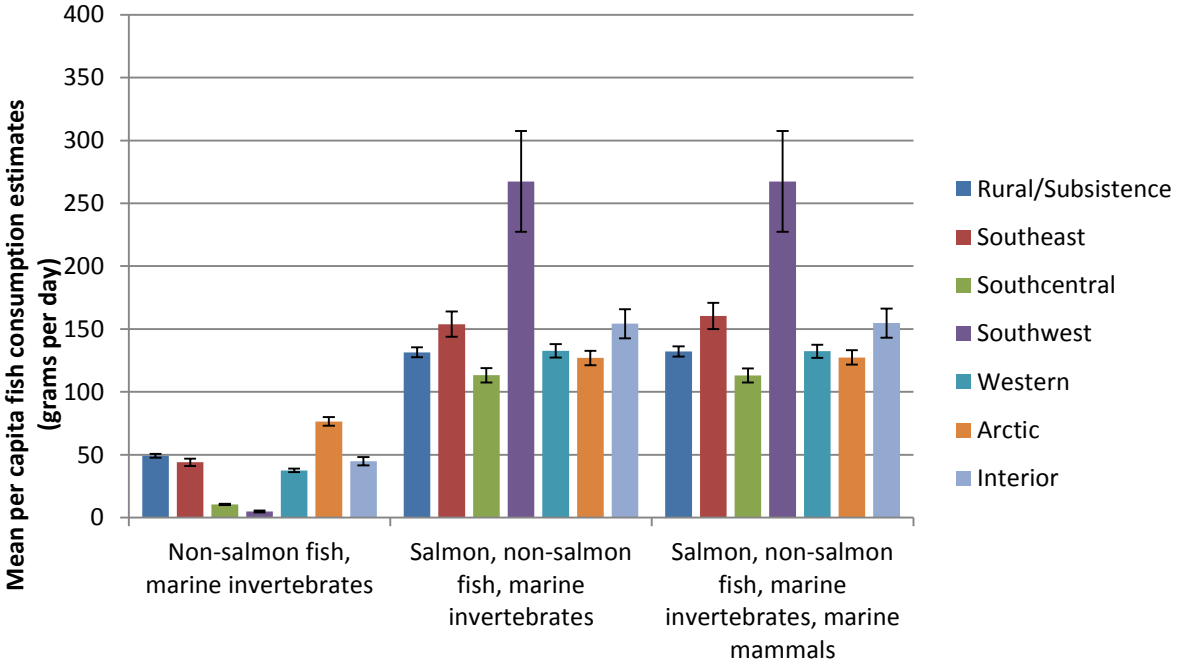


Figure 4. Mean fish consumption rate with confidence intervals by region and by resources included in analysis.

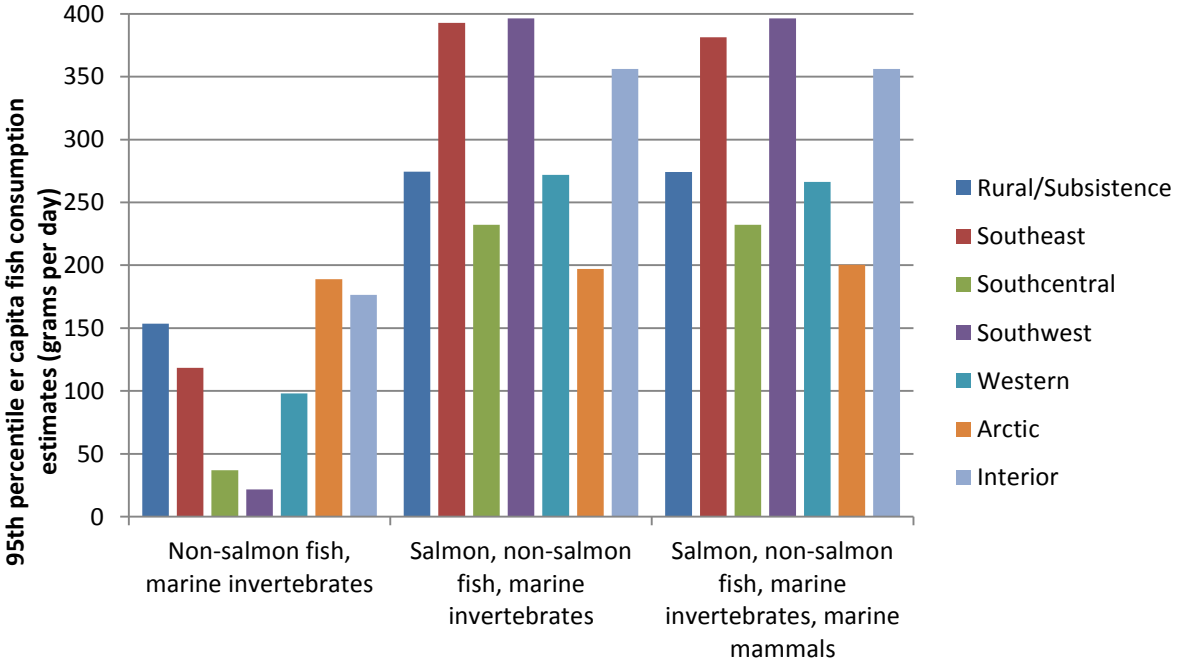


Figure 5. 95th percentile fish consumption rate by region and by resources included in analysis.